

## CLAIMS

### What is claimed is:

1. A melt extrusion spinneret plate having at least one capillary orifice  
5 for producing at least a single filament of circular cross sectional shape,  
said orifice having a perimeter of non-circular cross sectional shape,  
a perimeter measure  $p_c$ , and  
an extrusion area, wherein,  
said perimeter measure  $p_c$ , is greater than either of:  $2\pi R$  and  $2\pi r$ ,  
10 and further wherein, said extrusion area is greater than  $\pi r^2$  and less  
than  $\pi R^2$ ,  
and further wherein,  $r$  is the radius of the largest circle inscribed by  
the orifice perimeter,  
and  $R$  is the radius of the largest circle circumscribing the orifice  
15 perimeter.
2. The melt extrusion spinneret plate according to Claim 1, wherein said  
perimeter measure  $p_c$ , is about 2 to about 10 times greater than either of  
 $2\pi R$  and  $2\pi r$ .  
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3. The melt extrusion spinneret plate according to Claim 1, wherein the  
orifice has about 5 to about 12 radially arranged legs.
4. The melt extrusion spinneret plate according to Claim 1, wherein the  
25 orifice has a cross-sectional area substantially the same as that area of a  
circular cross-section spinneret capillary having a radius  $R$  and,  
simultaneously, the orifice having a perimeter measure  $p_c$ , greater than the  
perimeter  $2\pi R$  of the circular cross-section spinneret capillary.
- 30 5. A process for making a nylon filament of circular cross-sectional  
shape comprising the steps of:  
supplying a molten polymer to a spin pack;

extruding the polymer through a spinneret plate having at least one orifice of a profiled non-circular shape to form a freshly extruded filament having a circular cross-section;

quenching the freshly extruded filament with conditioned air;

5        drawing the filament, and  
winding the drawn filament.

6.     The process of claim 5, further including the step of stabilizing the drawn filament using a heated fluid.

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7.     The process of claim 5, further including the step of providing a yarn oil finish.

8.     The process of claim 5, wherein the polymer has an RV of 40 to 65.

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9.     The process of claim 5, wherein the polymer is extruded at a jet velocity in the range of 20 centimeters per second to 80 centimeters per second.

20    10.    The process of claim 5, wherein the filament is drawn by an amount of 1.0 to 2.0 times.

11.    The process of claim 5, wherein the filament is wound at a speed of 4500 to 6500 meter per minute.

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12.    A nylon filament of circular cross-sectional shape formed using the process of claim 5.